

#36

GEORGE C. MARSHALL



SATURN V PROGRAM DIRECTIVE

NUMBER: 36

SUBJECT: IMPLEMENTATION OF PROCEDURE FOR:
CERTIFYING THE QUALIFICATION OF FLIGHT CRITICAL COMPONENTS

ORIGINAL ISSUE DATE: Sept. 8, 1966 REVISION NUMBER: _____
DATE OF REVISION: _____ PREPARED BY: Saturn V Reliability & Quality Office,
I-V-Q, Mr. Keyes/876-2870

I. PURPOSE

This Program Directive establishes:
"IMPLEMENTATION OF PROCEDURE FOR CERTIFYING THE QUALIFICATION OF FLIGHT
CRITICAL COMPONENTS"
as a uniform method for recording, by use of certificates, the qualifica-
tion of flight critical components of the SATURN V Launch Vehicles.

II. SCOPE

This Program Directive is applicable to all MSFC elements responsible for
SATURN V stages (SIC, SII, SIVB, IU) design, fabrication, assembly, test,
manufacturing checkout, post-firing checkout, shipment, and prelaunch
checkout.

III. POLICY

- A. The Stage Contractors and those responsible for Government Furnished
Equipment (GFE) shall comply with this SATURN V Program Directive.
- B. Contractor Furnished Equipment (CFE):
The Qualification Certificates for each SATURN V Launch Vehicle shall
be:
 - Endorsed by the Stage Contractors.
 - Approved by MSFC responsible laboratories.
 - Issued in accordance with provisions contained in
"SATURN V PROCEDURE FOR CERTIFYING THE QUALIFICATION OF FLIGHT
CRITICAL COMPONENTS" (see Enclosure 1)
- C. Government Furnished Equipment (GFE):
The Qualification Certificates for each SATURN V Launch Vehicle shall
be:
 - Approved by the responsible MSFC Design Laboratories.

Enc.1

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I-V-Q, Mr. Keyes/876-2870POLICY (Cont'd)

- Issued in accordance with provisions contained in "SATURN V PROCEDURE FOR CERTIFYING THE QUALIFICATION OF FLIGHT CRITICAL COMPONENTS" (see Enclosure 1).

Enc.1

IV. RESPONSIBILITIESA. The Saturn V Reliability and Quality Office (I-V-Q) shall:

1. Prepare the Procedure for Issuance and Use of Qualification Certificates.
2. Co-sign the Declaration of Completion for each SATURN V Stage (see Enclosure 1, Fig. 3).

Fig.3

B. The Saturn V Stage Contractors shall:

prepare, complete, and issue endorsed reproducible Qualification Certificates (see Enclosure 1, Fig. 1) for all flight critical components of their respective Stages for each SATURN V Launch vehicle.

Fig.1

C. The MSFC Quality and Reliability Assurance Laboratory (R-QUAL-Q) shall:

1. Instruct their local R-QUAL-Q representatives to:
 - Receive from the Contracting Officer a reproducible and one copy of the contractor endorsed certificates.
 - Forward the endorsed reproducible Qualification Certificate to MSFC, R-QUAL-Q.
 - Forward the copy of the certificate to the appropriate stage manager's office at MSFC.
2. Obtain approval signatures, from the responsible MSFC Design Laboratory, in the space provided.
3. Sign the certificate in the space provided, to indicate their approval of the qualification conducted by the contractor.
4. Forward to designated recipient (see Enclosure 1, Fig. 4) the completed certificates for inclusion in their Log Book.
5. Provide completed Delinquency Certificates (see Enclosure 1, Fig. 2).

Fig.4

Fig.2

SATURN V PROGRAM DIRECTIVE

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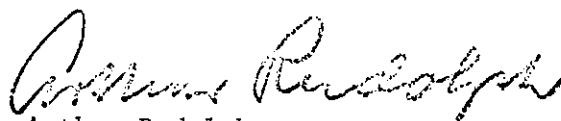
RESPONSIBILITIES (Cont'd)

6. Compile, maintain, and supply to John F. Kennedy Space Center (KSC), a completed Log Book for the appropriate SATURN V Launch Vehicle.
7. Conduct such operations and take such actions as are necessary for the timely implementation and completion of the Log Books.

D. SATURN V STAGE MANAGERS shall:

1. Implement this directive on all Stage contracts to ensure effectiveness on SA-501 and subsequent vehicles.
2. Sign the Declaration of Completion (see Enclosure 1, Fig. 3) indicating that all certificates have been properly executed and are contained in the Log Book.

Fig.3


Arthur Rudolph
Manager, Saturn V Program

1 Enc.
a/s

Distribution:

For ACTION:

I-V-Q, Mr. Moody
I-V-SIC, Mr. Urlaub
I-V-SII, Colonel Yarchin
I-V-SIVB, Mr. Godfrey (3)
I-V-IU, Mr. Duerr (3)
R-QUAL-Q, Mr. Bunn

For INFO:

R-DIR, Mr. Weidner
R-QUAL-DIR, Mr. Grau
R-ASTR-DIR, Dr. Haeussermann (4)
R-P&VE-DIR, Dr. Lucas (3)
R-OM, Mr. Fellows (2)
R-OM, Mr. Faulkner
I-V-MGR, Dr. Rudolph
I-V-P, Mr. Sneed
I-V-T, Mr. Burns (3)
I-V-F, Mr. Rowan
I-V-E, Mr. Bell
I-V-G, Mr. Smith (3)
R-QUAL-R, Mr. Chandler (2)
R-QUAL-Q, Mr. Brien (2)
R-QUAL-J, Mr. Klauss
R-S, Mr. Richards

SATURN V
PROCEDURE FOR
CERTIFYING THE QUALIFICATION OF
FLIGHT CRITICAL COMPONENTS

September 2, 1966

Enclosure 1 (to "IMPLEMENTATION OF PROCEDURE FOR:
CERTIFYING THE QUALIFICATION OF FLIGHT CRITICAL COMPONENTS").

"SATURN V PROCEDURE FOR CERTIFYING THE QUALIFICATION OF FLIGHT
CRITICAL COMPONENTS"

This procedure shall be incorporated into the SATURN V management and
reporting system and be required for all SATURN V Stages.

APPROVED:

Arthur R. Rindley
SATURN V PROGRAM MANAGER

CONCURRENCE:

William E. O'Leary
for Chief, Test Management Office
Saturn V Program

Charles A. Faulkner
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R-OM-V

J. M. Pugh
S-IC Stage Manager

John F. Stone
S-II Stage Manager

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S-IVB Stage Manager

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I.U. Stage Manager

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R-QUAL-Q

W. Crenshaw
Chief, Saturn V Systems
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SATURN V
PROCEDURE FOR CERTIFYING THE QUALIFICATION OF
FLIGHT CRITICAL COMPONENTS

I. PROPOSAL:

It is proposed that a formalized procedure be established for identifying, recording, and providing in-depth visibility of the operations conducted to qualify flight critical components of the SATURN V Launch Vehicle.

II. DESCRIPTION OF PROCEDURE:

The procedure is based upon the adoption and use of a Qualification Certificate (see Fig. 1). This is a detailed description of the procedure for processing the certificate through the engineering management channels of the SATURN V Stage Contractors and through MSFC channels to its' final point of use.

Fig.1

Stage Contractor:

- The Qualification Certificates shall be completed and signed by designated Stage Contractor personnel within ten working days following completion of the analysis of qualification data (see Fig. 4).

Fig.4

Resident R-QUAL Representative:

- In order to expedite the initiation of the certificates, the resident R-QUAL representative shall be responsible for insuring the timeliness as an adjunct to his primary responsibilities.
- Upon expiration of the allotted time cited above, he shall initiate actions through the CONTRACTING OFFICER'S representative to obtain the completed certificate.
- Upon completion of the Certificate, the Prime Contractor shall forward a signed reproducible copy through the appropriate channels to the R-QUAL representative at his plant.
- The local R-QUAL representative will then forward the Master and a copy of the signed certificate to MSFC, Attention: R-QUAL-Q and to the appropriate stage manager respectively.

R-QUAL-Q:

- Upon receipt of the reproducible copy of the certificate certifying qualification of Contractor Furnished Equipment (CFE), R-QUAL-Q shall initiate such action as necessary to obtain required signatures, attesting to the fact that the component has indeed undergone suitable qualification operations as specified and is indeed a qualified component.

DESCRIPTION OF PROCEDURE (Cont'd)

- R-QUAL-Q shall take such action to insure that Flight Critical Government Furnished Equipment is documented by appropriate Qualification Certificates.
- R-QUAL-Q shall supply copies of the approved certificates to designated recipients (see Fig. 4). Fig.4
- R-QUAL-Q shall perform the following tasks:
 - Maintain in a Log Book (hereafter described), the original Masters of the final certificates.
 - Compile, maintain, and transmit to KSC the Log Book containing all final certificates of flight critical components of the SATURN V Launch Vehicle at a time and place hereafter specified (paragraph IV).
- Certificates missing from the Log Book at the time of initial submittal shall be indicated by insertion of a Delinquency Certificate (see Fig. 2) showing the delinquent component, its' subsystem, system, stage, and a brief statement of delinquency reasons. At the time of receipt of the formal certificate, the Delinquency Certificate sheet shall be withdrawn from the Log Book and the certificate inserted in its' place. Fig.2
- At the front of each stage section of certificates a form (Fig. 3) will be inserted into the Log Book bearing the signatures of the responsible stage manager or his authorized representative, and of I-V-Q attesting to the fact that all necessary certificates are contained in the following section. Fig.3

III. DESCRIPTION OF DOCUMENTS:

The documentation introduced by this procedure consists of two discrete parts: Qualification Certificates and the Certificate Log Book. These two parts of the Certificate documentation are discussed in detail in the following paragraphs:

A. Qualification Certificates:

The Qualification Certificate shall contain the information shown (see Fig. 1). It is designed to identify the component, its system/subsystem, methodology of qualification, supporting documents, vendors, Prime Contractor, failures and/or nonconformances experienced or granted and including the approving authority. The "Call-Outs" appearing on the Certificate are self-explanatory and should be completed and signed concurrently. Fig.1

Reproducible master copies of the completed certificates shall be signed by the Prime Contractor's designated representatives concerned with the design, development, and qualification of the specific component shown on the certificate. The master

DESCRIPTION OF DOCUMENTS (Cont'd)

copy will then be forwarded (see paragraph II) for Governmental approval signatures.

B. Certificate Log Book (CLB):

For each SATURN V Launch Vehicle (501, 502, etc.) a Log Book shall be maintained for each stage thereof (loose leaf form), in which the Master copies of the Qualification Certificates are stored (see paragraph II). The Log will be appropriately indexed by systems and subsystems. Appropriate certificates shall be inserted in their proper place according to the index cited above.

One Log shall be supplied to KSC (see paragraph II) at the Pre-Delivery Review (Turnover Session) while missing certificates will be supplied as they become available. The Master record copy will be maintained by R-QUAL-Q as a permanent record.

IV. CERTIFICATE SUBMITTAL:

Submittal and use of the Qualification Certificates must be integrated into the existing technical and administrative reviews of the SATURN V Program. Key milestones to which the Certificates are related are as follows:

A. Pre-Delivery Review (Turnover Session):

This review will be the point in time when the flight vehicle's Qualification Certificate Log is presented to the authorized KSC personnel. At that time all certificates should have been completed and inserted into their proper places in the Log. In the event that some certificates have been delayed, a Delinquency Certificate will be inserted in its' place (see paragraph II) indicating a delinquency in certification. The Delinquency Certificate will be replaced as the actual certificate becomes available.

B. Associate Administrator MSF (Manned Space Flight) Design Certification Review:

At this review, the Log will be completed with all certificates properly signed by the appropriate authority for launch vehicles SA-503 and subsequent. IN ORDER TO DEVELOP CONFIDENCE IN THE FLIGHT WORTHINESS OF SATURN V, IT IS ESSENTIAL THAT THIS DOCUMENT BE COMPLETED IN TIME TO SERVE AS A SOURCE OF REFERENCE FOR THE QUALIFICATION OF ALL FLIGHT CRITICAL ITEMS.

C. Program Manager's Pre-Flight Review:

At this review, the Qualification Certificate Log will be used as an in-depth support document for the Certificate

CERTIFICATE SUBMITTAL (Cont'd)

of Flight Worthiness (COFW). For SATURN V vehicles, 501 and 502, the Log Book must be completed in time to support this review.

(GUIDANCE FOR FORMAT)

SATURN V

CERTIFICATE OF COMPONENT

QUALIFICATION

LAUNCH VEHICLE NUMBER EFFECTIVITY: _____

Component: _____ System/Subsystem: _____
Part No: _____ Prime Contract No: _____
Vendor: _____ Submittal Date: _____
Vendor Part No: _____

Qualification Method: Prior Usage (P): _____ Analysis (A): _____ Test (T): _____
Higher Assembly (H): _____ Similarity (S): _____

I. Applicable Documents: (Enter Document Number)

A. Component Specification: _____ D. Qual. Test Procedure _____
B. Qualification Test Plan: _____ E. Qual. Test Report _____
C. Qual. Test Specification: _____ F. Other Documentation _____

II. Component Part No:

A. Higher Assembly Part No: _____
B. Similarity Part No: _____
C. Vendor: _____

III. Failure:

A. Failure Occurred During Qualification Testing
B. Failure has been Analyzed and Corrective Action Completed
C. Reported in: _____

NA	YES	NO

IV. Nonconformance Request has been Approved:

V. Component Qualification Tests:

A. Were Conducted in Accordance with Item I.D. Above
B. Requirements Met

This Component has been Qualified and is so Certified for SATURN V Launch Vehicle as noted above under Effectivity.

Prime Contractor:

Marshall Space Flight Center:

APPROVED: _____
Engr. Dept. (name & date)

APPROVED: _____
Design Engineer (Lab, name, date, phone)

APPROVED: _____
Qual/Rel. Dept. (name & date)

APPROVED: _____
R-QUAL-Q (name, date & phone)

SATURN V

COMPONENT CERTIFICATION DELINQUENCY CERTIFICATE

Part Number: _____ SATURN V Stage: _____

Component: _____ System/Subsystem: _____

The Qualification Operation required for the Component listed above
has not been *approved/completed as of this date.

(Name, phone & date)

R-QUAL-Q

*Strike non-applicable word.

SATURN V
DECLARATION OF COMPLETION OF
COMPONENT QUALIFICATION

The Qualification of Flight Critical Components for SATURN V

S_ _ _ _ Stage has been completed as attested by the Certificate
of Qualification.

All Certificates of Qualification required for SATURN V Stages in
compliance with the intent of NPC 500-10 have been properly executed
by the Prime Contractor, and by the authorized Government representa-
tives, and are contained in this Log of Certificates.

S_ _ _ _ Stage Manager
(Name, phone & date)

I-V-Q
Qualification Test Branch
(Name, phone & date)

SATURN V
FLOW CHART FOR
QUALIFICATION CERTIFICATES

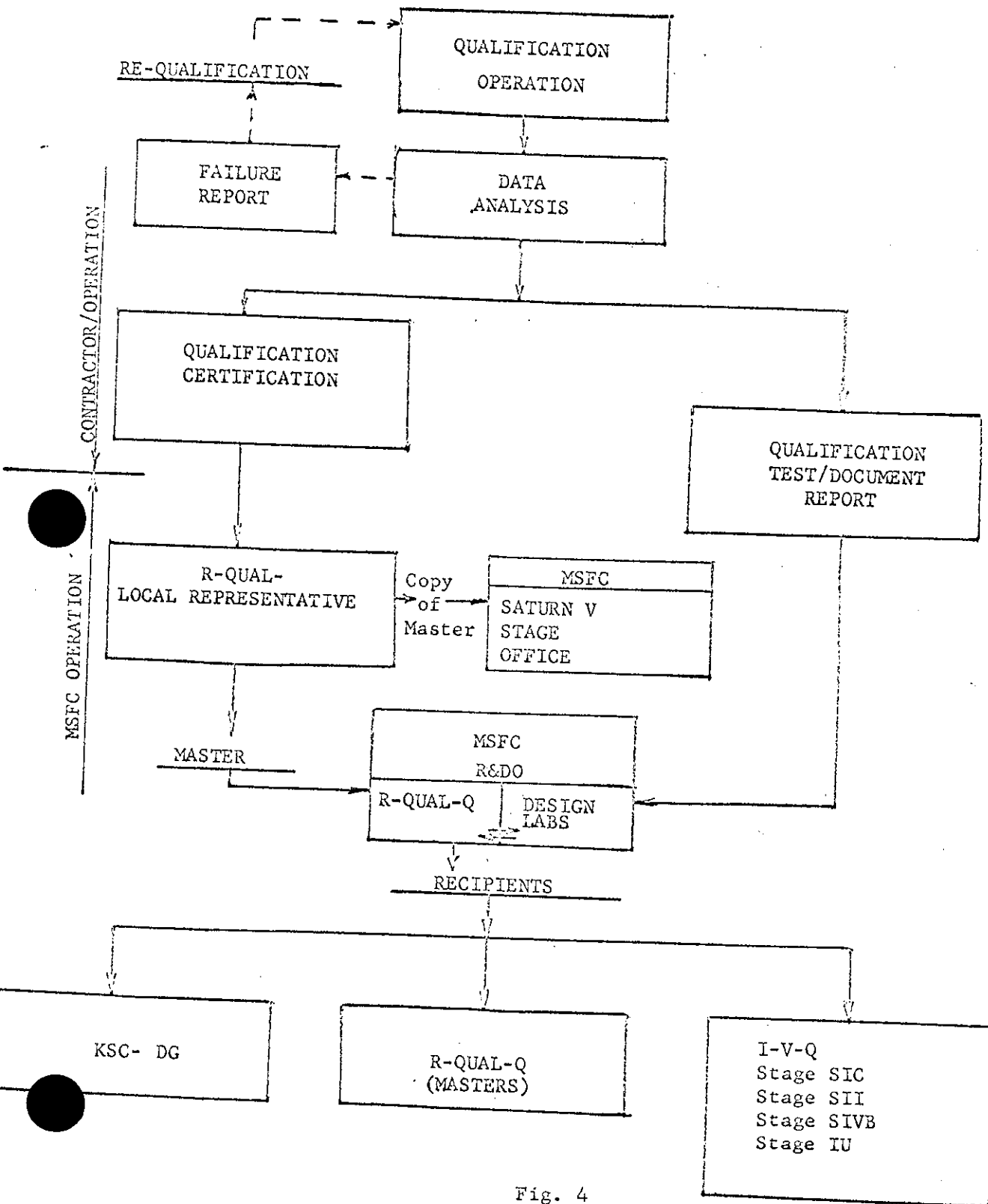


Fig. 4
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